

MIDDLE FORK RESERVOIR
Wayne County
2006 Fish Management Report

Christopher C. Long
Assistant Fisheries Biologist



Fisheries Section
Indiana Department of Natural Resources
Division of Fish and Wildlife
I.G.C.-South, Room W273
402 W. Washington Street
Indianapolis, Indiana 46204

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EXECUTIVE SUMMARY

- Middle Fork Reservoir is a 177-acre water supply impoundment located in Richmond, Indiana.
- A fishery survey was conducted May 30 to June 1, 2006 to evaluate the predator/prey balance, determine the age of dominant sportfish, and evaluate recruitment of largemouth bass, bluegill, and white crappie.
- A total of 1,650 fish representing 13 species and hybrid sunfish was collected with an estimated weight of 781 lbs. The three most abundant species collected by number were white crappie (952), bluegill (333), and largemouth bass (150). The three most abundant species collected by weight were common carp (180 lbs), white crappie (178 lbs), and white sucker (156 lbs).
- White crappie ranged in length from 4.6 to 10.2 in and averaged 7.6 in. Approximately 64% of the white crappie were 7.5 to 8.0 in long. Age-4 and age-5 crappie made up 27 and 46% of the sample, respectively.
- Bluegill ranged in length from 2.1 to 8.6 in and averaged 5.7 in. Forty-three percent of the bluegill collected were harvestable size (≥ 6 in).
- Largemouth bass ranged in length from 3.8 to 18.9 in and averaged 11.1 in. Seventeen percent of the largemouth bass collected met or exceeded the 14-in minimum length limit.
- Eighteen channel catfish were collected that ranged in length from 13.5 to 29.0 in. All channel catfish were considered harvestable size. The largest channel catfish weighed approximately 12 lbs. Natural reproduction is evident and therefore supplemental stockings are not recommended.
- Populations of largemouth bass and bluegill need to be monitored to ensure satisfactory recruitment in response to the abundance of white crappie. The next fisheries survey is scheduled for 2008.

INTRODUCTION

Middle Fork Reservoir is a 177-acre impoundment located in Richmond, Indiana. The lake was built in the early 1960's as a water supply reservoir for the city. The Richmond Department of Parks and Recreation leases the lake along with 350 acres of surrounding land. A fee is required to launch a boat or avid visitors can purchase an annual launch permit. There is also a 6 hp maximum limit on outboard motors.

Fisheries managers can utilize few management strategies other than fish stockings and fishing regulations since Middle Fork Reservoir is used as a potable water supply. Management options such as drawdowns and the use of fish toxicants are prohibited. Statewide size and creel limits apply for largemouth bass, white crappie, and channel catfish at Middle Fork Reservoir.

In both 2000 and 2002, largemouth bass was the most abundant species collected at Middle Fork Reservoir. The expansion of the largemouth bass population led to increased predation on crappie and bluegill. As a result, bluegill and crappie growth and size structure were good. However, by 2004 the white crappie population exploded causing growth of crappie to decline and the recruitment of largemouth bass and bluegill to suffer.

The goal of the 2006 fisheries survey at Middle Fork Reservoir was to describe the predator/prey balance, determine the age of the dominant sportfish, and evaluate recruitment of largemouth bass, bluegill, and white crappie.

METHODS

The survey was conducted from May 30 to June 1, 2006. Physical and chemical characteristics were collected for water quality and measured in the deepest area of the lake according to the Division of Fish and Wildlife (DFW) sampling guidelines (Shipman 2001). Submersed aquatic vegetation was sampled on July 18, 2006, using guidelines written by DFW (2006).

Fish were collected using three sampling gears. Pulsed DC shoreline electrofishing was conducted at night for 1.0 h with two dippers. Four trap nets and eight experimental-mesh gill nets were also fished overnight. All fish collected were measured to the nearest 0.1 in TL. Average weights for Fish Management District 5, or length-weight regressions were used to estimate the weight of all fish collected. Scales were taken from largemouth bass, bluegill, and white crappie for age and growth analysis. Proportional stock density (PSD) was calculated for

largemouth bass and bluegill (Anderson and Neumann 1996). The Bluegill Fishing Potential Index (BGFP), developed by Ball and Tousignant, 1996, was utilized to describe the bluegill fishing opportunities at Middle Fork Reservoir.

RESULTS

The surface temperature at Middle Fork Reservoir on May 30 was 70.9 °F and 60.9 °F at 26 ft. Alkalinity was 153.9 mg/L at both the surface and 26 ft. Conductivity was 420 µS and the Secchi disk reading was 7.5 ft.

No submergent vegetation was collected. Non-submergent vegetation observed included cattails, filamentous algae, water willow, arrowhead, duckweed, watermeal, and sweetflag.

Altogether, 1,650 fish representing 13 species and hybrid sunfish were collected with an estimated weight of 781 lbs. The three most abundant species collected by number were white crappie (58%), bluegill (20%), and largemouth bass (9%). The three most abundant species collected by weight were common carp (23%), white crappie (23%), and white sucker (20%).

A total of 952 white crappie was collected that weighed 178 lbs. The relative abundance of white crappie was similar between 2004 and 2006 (56 and 58%, respectively). The catch rate (CPUE) of white crappie was 57.6/gill net lift and 35.0/trap net lift. Electrofishing yielded a CPUE of 351.0 crappie/h. White crappie ranged in length from 4.6 to 10.2 in and averaged 7.6 in compared to 6.8 in in 2004. Sixty-four percent of the white crappie collected measured between 7.5 and 8.0 in. Age-1 white crappie made up 1% of the sample. However, 27% of crappie were age 4 and 46% were age 5. The large number of age-4 and age-5 crappie was expected because in 2004, approximately 99% of white crappie were age 2 and age 3 (Long 2006).

A total of 333 bluegill that weighed roughly 49 lbs was collected. Bluegill was the second most abundant species collected by number (20%) and the fifth most abundant by weight (6%). Electrofishing yielded a CPUE of 276.0 bluegill/h. Bluegill ranged in length from 2.1 to 8.6 in and averaged 5.7 in. Forty-three percent of the bluegill collected were greater than 6 in long, which was down from 58% in 2004. Bluegill PSD was 44. The BGFP score was 26 which qualifies the bluegill fishery as excellent. The survey revealed that 19% of the bluegill collected were age 1 and 34% were age 2.

Largemouth bass was third in abundance by number (9%) and fourth by weight (16%). There were 150 largemouth bass weighing 128 lbs collected. Electrofishing yielded a CPUE of 150.0 bass/h. Largemouth bass ranged in length from 3.8 to 18.9 in and averaged 11.1 in. Only 17% of bass met or exceeded the 14-in minimum length limit compared to 60% just two years ago. Largemouth bass PSD was 64. Nineteen percent of the largemouth bass collected were age 1. Only one age-1 bass was collected in 2004.

White sucker, a fish commonly found in Indiana streams, accounted for 6% of the sample by number and 20% by weight. The 97 white sucker collected ranged in length from 8.5 to 20.0 in and averaged 15.4 in.

Twenty-four common carp that weighed 180 lbs were collected. Carp ranked first in abundance by weight (23%). The largest carp collected measured 34.5 in and weighed nearly 20 lbs.

Overall, 18 channel catfish were collected that weighed 45 lbs. Channel catfish ranged in length from 13.5 to 29.0 in. Additionally, 16 black bullheads that weighed 26 lbs were collected. Black bullhead ranged in length from 10.6 to 16.8 in and averaged 14.2 in. Two yellow bullhead and one brown bullhead were also collected and all measured 12.8 in.

Other fish collected were golden shiner, green sunfish, golden redhorse, pumpkinseed, and hybrid sunfish. Together these species comprised 3% of the sample by number and 2% by weight.

DISCUSSION

White crappie has been the most abundant species at Middle Fork Reservoir since 2004 as a result of the large year classes spawned in 2001 and 2002. These year classes accounted for 99% of the crappie collected in 2004 and 73% in 2006. The relative abundance of white crappie was similar between 2004 and 2006 and therefore it appears that their abundance has leveled off. Excluding age-2 white crappie, which accounted for 19% of the collection, crappie recruitment has declined considerably the past few years. Together, age-1 and age-3 white crappie represented only 7% of the crappie collected. Now that the 2001 and 2002 year classes of white crappie average over 7.5 in, they are more likely to be harvested. Crappie abundance is expected to decline considerably over the next several years since there are fewer young fish in the population to replace those lost to harvest and natural mortality.

In 2004, the 2001 and 2002 year classes of white crappie impacted the recruitment of largemouth bass and bluegill due to increased competition. Over the past couple of years, competition between crappie, bass, and bluegill has decreased because there are fewer young crappie present. As a result, largemouth bass and bluegill recruitment has improved. In 2006, 19% of largemouth bass and bluegill were age 1 and 53% of bluegill were either age 1 or 2. This is an improvement from 2004 when only one age-1 largemouth bass was collected and less than 10% of bluegill were age 1 and 2. Largemouth bass and bluegill should be able to sustain quality fisheries now that recruitment has improved.

The proportion of largemouth bass greater than 14 in declined from 60 to 17% between 2004 and 2006, respectively. In 2000, about 47% of the largemouth bass caught were age 1 (Wisener 2003). By 2004, the 1999 year class was age 5 and likely a large contributor to the 60% of bass that were greater than 14 in. It's likely that the majority of the large 1999 year class of largemouth bass has succumbed to natural and fishing mortality. Improved recruitment and the decline of the 1999 year class both provide reasonable explanations as to why only 17% of bass met or exceeded 14 in in 2006. Therefore, anglers are encouraged to practice catch and release of largemouth bass to help sustain their numbers and increase predation on panfish and rough fish (i.e. carp and white sucker). Significant predation by largemouth bass will allow panfish to reach a size more desirable by anglers and keep rough fish from overpopulating.

Eighteen channel catfish were collected and all were more than 12 in long. Channel catfish have not been stocked since 1997 but natural reproduction is sustaining the population. Additionally, black bullheads are providing a significant contribution to the catfish fishery. Since successful recruitment of channel catfish and bullhead species is occurring and quality-sized catfish are available to anglers, supplemental stocking of channel catfish is not recommended.

The next fisheries survey should be conducted in 2008. The survey will focus on the predator/prey balance and how the fishery has responded to the changing white crappie population.

RECOMMENDATIONS

- The fishery should be resampled in 2008 to evaluate the predator/prey balance, age, and growth of the dominant sportfish.

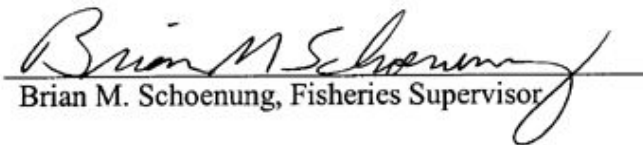
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Submitted by: Christopher C. Long, Assistant Fisheries Biologist

Date: March 5, 2007

Approved by: J. Rhett Wisener, Fisheries Biologist

Approved by: 
Brian M. Schoenung, Fisheries Supervisor

Date: July 6, 2007

LAKE SURVEY REPORT

Type of Survey
<input type="checkbox"/> Initial Survey <input checked="" type="checkbox"/> Re-Survey

Lake Name	County	Date of survey (Month, day, year)
Middle Fork Reservoir	Wayne	5/30/06 - 6/1/2006
Biologist's name	Date of approval (Month, day, year)	
Christopher C. Long	7/6/2007	

LOCATION		
Quadrangle Name	Range	Section
New Paris, Richmond	1W	21,22,27,28
Township Name	Nearest Town	
14N	Richmond	

ACCESSIBILITY					
State owned public access site			Other access site		
			Owned by Richmond Dept. of Parks & Recreation		
Surface acres	Maximum depth	Average depth	Acre feet	Water level	Extreme fluctuations
177	40 ft	21.3 ft	3,770	971 msl	15 ft
Location of benchmark					
T14N, R1W, S21, SW1/4, SW1/4 on Hwy. 27					

INLETS		
Name	Location	Origin
Middle Fork of East Fork of Whitewater River	Northeast side	Spartansburg, OH
Unnamed tributary	North side	

OUTLETS			
Name	Location		
Middle Fork of East Fork of Whitewater River	South end		
Water level control			
Five 20-in round, varied level sluice gates and spillway			
POOL	ELEVATION (Feet MSL)	ACRES	Bottom type <input type="checkbox"/> Boulder <input checked="" type="checkbox"/> Gravel <input checked="" type="checkbox"/> Sand <input checked="" type="checkbox"/> Muck <input type="checkbox"/> Clay <input type="checkbox"/> Marl
TOP OF DAM	985		
TOP OF FLOOD CONTROL POOL	971	177	
TOP OF CONSERVATION POOL	971	177	
TOP OF MINIMUM POOL	935		
STREAMBED	931		
Watershed use			
Agricultural, residential, and industrial			
Development of shoreline			
Concrete boat ramp, boat docks, handicap accessible fishing piers			
Previous surveys and investigations			
Fish population studies: 1963 and 1964. Management surveys: 1973, 1975, 1982, 1984, 1986, 1988, 1990, 1991, 1992, 1997, 2000, 2002, and 2004. Spot-check survey: 1981. Largemouth bass population estimate: 1990.			
Bluegill survey: 1991.			

SAMPLING EFFORT					
ELECTROFISHING	Day hours		Night hours		Total hours
			1.0		1.0
TRAP NETS	Number of traps		Number of Lifts		Total effort
	4		1		4 lifts
GILL NETS	Number of nets		Number of Lifts		Total effort
	8		1		8 lifts
ROTENONE	Gallons	ppm	Acre Feet Treated	SHORELINE SEINING	Number of 100 Foot Seine Hauls

PHYSICAL AND CHEMICAL CHARACTERISTICS			
Color		Turbidity	
Clear		7 Feet	6 Inches (SECCHI DISK)
Alkalinity (ppm)*		pH	
Surface: 153.9 Bottom: 153.9		Surface: Bottom:	
Conductivity:		Air temperature:	
420 microsiemens		°F	
Water chemistry GPS coordinates:			
N		W	

TEMPERATURE AND DISSOLVED OXYGEN (D.O.)								
DEPTH (FEET)	Degrees (°F)	D.O. (ppm)	DEPTH (FEET)	DEGREES (°F)	D.O. (ppm)	DEPTH (FEET)	DEGREES (°F)	D.O. (ppm)
SURFACE	70.9	7.80	36			72		
2	70.7	7.95	38			74		
4	69.1	7.78	40			76		
6	68.7	8.22	42			78		
8	68.1	7.90	44			80		
10	67.2	7.23	46			82		
12	66.7	7.06	48			84		
14	66.1	6.65	50			86		
16	65.3	6.50	52			88		
18	64.4	6.60	54			90		
20	63.8	5.95	56			92		
22	63.0	5.63	58			94		
24	62.1	5.64	60			96		
26	60.9	5.17	62			98		
28			64			100		
30			66					
32			68					
34			70					

COMMENTS	

*ppm-parts per million

Occurrence and Abundance of Submersed Aquatic Plants - Overall

Lake: Middle Fork Reservoir	Secchi(ft): 4.5	SE Mean species / site: 0
Date: 7/18/2006	Littoral sites with plants: 0	Mean natives / site: 0
Littoral Depth (ft): 7.0	Number of species: 0	SE Mean natives / site: 0
Littoral Sites: 50	Maximum species / site: 0	Species diversity: 0
Total Sites: 50	Mean species / site: 0	Native diversity: 0

Species	Frequency of Occurrence	Score Frequency				Dominance
		0	1	3	5	
None						

Filamentous algae	24.0
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Other species noted: Cattail, water willow, arrowhead, duckweed, watermeal, sweetflag

SPECIES AND RELATIVE ABUNDANCE OF FISHES COLLECTED BY NUMBER AND WEIGHT					
*COMMON NAME OF FISH	NUMBER	PERCENT	LENGTH RANGE (inches)	WEIGHT (pounds)	PERCENT
White crappie	952	57.7	4.6 - 10.2	177.57	22.7
Bluegill	333	20.2	2.1 - 8.6	49.07	6.3
Largemouth bass	150	9.1	3.8 - 18.9	128.26	16.4
White sucker	97	5.9	8.5 - 20.0	155.95	20.0
Golden shiner	40	2.4	5.5 - 8.9	6.04	0.8
Common carp	24	1.5	18.8 - 34.5	180.20	23.1
Channel catfish	18	1.1	13.5 - 29.0	44.70	5.7
Black bullhead	16	1.0	10.6 - 16.8	26.22	3.4
Green sunfish	8	0.5	3.1 - 7.0	1.18	0.2
Golden redhorse	5	0.3	10.0 - 18.4	6.93	0.9
Pumpkinseed	3	0.2	5.7 - 7.3	0.80	0.1
Yellow bullhead	2	0.1	12.8	2.20	0.3
Brown bullhead	1	0.1	12.8	1.29	0.2
Hybird sunfish	1	0.1	7.7	0.29	< 0.1
Total	1,650			780.70	

*Common names of fishes recognized by the American Fisheries Society.

NUMBER, PERCENTAGE, WEIGHT, AND AGE OF White crappie									
TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH	TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH
1.0					19.0				
1.5					19.5				
2.0					20.0				
2.5					20.5				
3.0					21.0				
3.5					21.5				
4.0					22.0				
4.5	11	1.2	0.04	1	22.5				
5.0	1	0.1	0.05	2	23.0				
5.5	10	1.1	0.07	2	23.5				
6.0	93	9.8	0.10	2	24.0				
6.5	79	8.3	0.12	2	24.5				
7.0	67	7.0	0.16	4, 5	25.0				
7.5	311	32.7	0.19	4, 5	25.5				
8.0	299	31.4	0.22	3, 4, 5	26.0				
8.5	71	7.5	0.27	4, 5	TOTAL	952			
9.0	7	0.7	0.33	5					
9.5	2	0.2	0.38	not aged					
10.0	1	0.1	0.45	not aged					
10.5									
11.0									
11.5									
12.0									
12.5									
13.0									
13.5									
14.0									
14.5									
15.0									
15.5									
16.0									
16.5									
17.0									
17.5									
18.0									
18.5									
ELECTROFISHING CATCH		351.0/hr		GILL NET CATCH	57.6/lift		TRAP NET CATCH	35.0/lift	

NUMBER, PERCENTAGE, WEIGHT, AND AGE OF Bluegill									
TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH	TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH
1.0					19.0				
1.5					19.5				
2.0	8	2.4	0.01	1	20.0				
2.5	22	6.6	0.01	1	20.5				
3.0	19	5.7	0.02	1	21.0				
3.5	12	3.6	0.03	1	21.5				
4.0	12	3.6	0.04	1, 2	22.0				
4.5	37	11.1	0.06	2, 4	22.5				
5.0	50	15.0	0.08	2	23.0				
5.5	29	8.7	0.11	2, 3	23.5				
6.0	22	6.6	0.15	2, 3, 4	24.0				
6.5	18	5.4	0.20	3, 4	24.5				
7.0	37	11.1	0.25	3, 4	25.0				
7.5	52	15.6	0.31	4, 5	25.5				
8.0	13	3.9	0.38	5, 6	26.0				
8.5	2	0.6	0.47	5	TOTAL	333			
9.0									
9.5									
10.0									
10.5									
11.0									
11.5									
12.0									
12.5									
13.0									
13.5									
14.0									
14.5									
15.0									
15.5									
16.0									
16.5									
17.0									
17.5									
18.0									
18.5									
ELECTROFISHING CATCH		276.0/hr		GILL NET CATCH	2.3/lift		TRAP NET CATCH	9.8/lift	

NUMBER, PERCENTAGE, WEIGHT, AND AGE OF Largemouth bass									
TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH	TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH
1.0					19.0				
1.5					19.5				
2.0					20.0				
2.5					20.5				
3.0					21.0				
3.5	1	0.7	0.02	1	21.5				
4.0	12	8.0	0.03	1	22.0				
4.5	2	1.3	0.04	1	22.5				
5.0	2	1.3	0.05	1	23.0				
5.5	4	2.7	0.07	1	23.5				
6.0	4	2.7	0.09	1	24.0				
6.5	4	2.7	0.12	1, 2	24.5				
7.0	4	2.7	0.15	2	25.0				
7.5					25.5				
8.0	1	0.7	0.23	2	26.0				
8.5	5	3.3	0.28	2	TOTAL	150			
9.0	7	4.7	0.33	2, 3					
9.5	3	2.0	0.40	2					
10.0	6	4.0	0.46	2, 3					
10.5	5	3.3	0.54	4					
11.0	9	6.0	0.63	3, 4					
11.5	6	4.0	0.72	3, 4					
12.0	14	9.3	0.82	3, 4					
12.5	17	11.3	0.95	3, 4					
13.0	12	8.0	1.08	4					
13.5	7	4.7	1.20	4, 5					
14.0	3	2.0	1.38	5					
14.5	2	1.3	1.56	5					
15.0	3	2.0	1.74	5, 6					
15.5	1	0.7	1.92	not aged					
16.0	1	0.7	2.15	not aged					
16.5	5	3.3	2.36	6					
17.0	7	4.7	2.62	4, 5, 6					
17.5	1	0.7	2.84	6					
18.0	1	0.7	3.18	not aged					
18.5	1	0.7	3.54	not aged					
ELECTROFISHING CATCH		150.0/hr		GILL NET CATCH	0/lift		TRAP NET CATCH	0/lift	

NUMBER, PERCENTAGE, WEIGHT, AND AGE OF White sucker									
TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH	TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH
1.0					19.0	4	4.1	2.84	
1.5					19.5	2	2.1	2.99	
2.0					20.0	1	1.0	2.77	
2.5					20.5				
3.0					21.0				
3.5					21.5				
4.0					22.0				
4.5					22.5				
5.0					23.0				
5.5					23.5				
6.0					24.0				
6.5					24.5				
7.0					25.0				
7.5					25.5				
8.0					26.0				
8.5	1	1.0	0.28	not aged	TOTAL	97			
9.0	1	1.0	0.34						
9.5	2	2.1	0.37						
10.0									
10.5	1	1.0	0.54						
11.0	3	3.1	0.61						
11.5	3	3.1	0.64						
12.0	3	3.1	0.79						
12.5	5	5.2	0.93						
13.0	7	7.2	1.03						
13.5	4	4.1	1.14						
14.0	2	2.1	1.42						
14.5	4	4.1	1.42						
15.0	7	7.2	1.54						
15.5	3	3.1	1.77						
16.0	10	10.3	1.84						
16.5	11	11.3	2.17						
17.0	7	7.2	2.29						
17.5	6	6.2	2.36						
18.0	6	6.2	2.41						
18.5	4	4.1	2.98						
ELECTROFISHING CATCH		0/hr		GILL NET CATCH	11.3/lift		TRAP NET CATCH		1.8/lift

NUMBER, PERCENTAGE, WEIGHT, AND AGE OF Common carp									
TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH	TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH
1.0					19.0				
1.5					19.5				
2.0					20.0				
2.5					20.5	1	4.3	3.97	
3.0					21.0	3	13.0	4.23	
3.5					21.5				
4.0					22.0	2	8.7	4.95	
4.5					22.5	1	4.3	5.36	
5.0					23.0	2	8.7	5.82	
5.5					23.5	3	13.0	6.11	
6.0					24.0				
6.5					24.5	1	4.3	6.82	
7.0					25.0	2	8.7	7.15	
7.5					25.5	1	4.3	8.11	
8.0					26.0	1	4.3	8.18	
8.5					26.5	1	4.3	8.68	
9.0					27.0	2	8.7	9.30	
9.5					27.5	1	4.3	9.90	
10.0					28.0				
10.5					28.5				
11.0					29.0	1	4.3	17.00	
11.5					29.5				
12.0					30.0				
12.5					30.5				
13.0					31.0				
13.5					31.5				
14.0					32.0				
14.5					32.5				
15.0					33.0				
15.5					33.5				
16.0					34.0				
16.5					34.5	1	4.3	23.81	
17.0					35.0				
17.5					TOTAL	24			
18.0									
18.5	1	4.3	2.90	not aged					
ELECTROFISHING CATCH		17.0/hr		GILL NET CATCH	0/lift		TRAP NET CATCH	1.8/lift	

NUMBER, PERCENTAGE, WEIGHT, AND AGE OF Channel catfish									
TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH	TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH
1.0					19.0	1	5.3	2.46	
1.5					19.5	1	5.3	2.69	
2.0					20.0				
2.5					20.5				
3.0					21.0				
3.5					21.5				
4.0					22.0				
4.5					22.5	1	5.3	4.53	
5.0					23.0	1	5.3	4.74	
5.5					23.5				
6.0					24.0				
6.5					24.5				
7.0					25.0				
7.5					25.5				
8.0					26.0				
8.5					26.5				
9.0					27.0				
9.5					27.5				
10.0					28.0				
10.5					28.5				
11.0					29.0	1	5.3	11.97	
11.5									
12.0									
12.5					TOTAL	18			
13.0									
13.5	1	5.3	0.73	not aged					
14.0									
14.5									
15.0									
15.5									
16.0	1	5.3	1.33						
16.5	1	5.3	1.51						
17.0	1	5.3	1.66						
17.5	5	26.3	1.81						
18.0	2	10.5	2.02						
18.5	2	10.5	2.20						
ELECTROFISHING CATCH		3.0/hr		GILL NET CATCH	1.9/lift		TRAP NET CATCH	0/lift	

NUMBER, PERCENTAGE, WEIGHT, AND AGE OF Black bullhead									
TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH	TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH
1.0					19.0				
1.5					19.5				
2.0					20.0				
2.5					20.5				
3.0					21.0				
3.5					21.5				
4.0					22.0				
4.5					22.5				
5.0					23.0				
5.5					23.5				
6.0					24.0				
6.5					24.5				
7.0					25.0				
7.5					25.5				
8.0					26.0				
8.5					TOTAL	16			
9.0									
9.5									
10.0									
10.5	1	6.3	0.67	not aged					
11.0									
11.5									
12.0	1	6.3	1.04						
12.5	1	6.3	1.25						
13.0	2	12.5	1.32						
13.5	2	12.5	1.41						
14.0	2	12.5	1.50						
14.5	2	12.5	1.72						
15.0	1	6.3	1.89						
15.5	2	12.5	2.15						
16.0									
16.5	2	12.5	2.59						
17.0									
17.5									
18.0									
18.5									
ELECTROFISHING CATCH		6.0/hr		GILL NET CATCH	0.1/lift		TRAP NET CATCH		2.3/lift

White crappie age-length Key															
Length group (in)	Total # number	Sub- sample	Age												
			1	2	3	4	5	6	7	8	9	10	11	12	13
1.0															
1.5															
2.0															
2.5															
3.0															
3.5															
4.0															
4.5	11	3	11												
5.0	1	1		1											
5.5	10	2		10											
6.0	93	4		93											
6.5	79	5		79											
7.0	67	5					40	27							
7.5	311	5					124	187							
8.0	299	5			60		60	179							
8.5	71	5					28	43							
9.0	7	1						7							
9.5	2	0													
10.0	1	0													
10.5															
Total	952	36	11	183	60	253	442								

Bluegill age-length Key															
Length group (in)	Total # number	Sub- sample	Age												
			1	2	3	4	5	6	7	8	9	10	11	12	13
1.0															
1.5															
2.0	8	3	8												
2.5	22	4	22												
3.0	19	5	19												
3.5	12	5	12												
4.0	12	4	3	9											
4.5	37	5		30		7									
5.0	50	5		50											
5.5	29	5		17	12										
6.0	22	6		7	11	4									
6.5	18	5			14	4									
7.0	37	5			7	30									
7.5	52	5				21	31								
8.0	13	3					9	4							
8.5	2	1					2								
9.0															
Total	333	61	64	113	44	65	42	4							

Largemouth bass age-length Key																
Length group (in)	Total # number	Sub- sample	Age													
			1	2	3	4	5	6	7	8	9	10	11	12	13	
1.0																
1.5																
2.0																
2.5																
3.0																
3.5	1	1	1													
4.0	12	3	12													
4.5	2	2	2													
5.0	2	1	2													
5.5	4	3	4													
6.0	4	2	4													
6.5	4	3	3	1												
7.0	4	1		4												
7.5																
8.0	1	1		1												
8.5	5	4		5												
9.0	7	5		3	4											
9.5	3	1		3												
10.0	6	4		2	5											
10.5	5	2				5										
11.0	9	3			3	6										
11.5	6	4			5	2										
12.0	14	5			6	8										
12.5	17	5			10	7										
13.0	12	3				12										
13.5	7	3				2	5									
14.0	3	2					3									
14.5	2	2					2									
15.0	3	2					2	2								
15.5	1	0														
16.0	1	0														
16.5	5	2						5								
17.0	7	3					2	2	2							
17.5	1	1						1								
18.0	1	0														
18.5	1	0														
19.0																
Total	150	68	28	19	32	42	14	10	2							

Mean length at Capture

White crappie

Age	Number	Mean TL	Var	SE	Lo 95%CI	Up 95%CI
1	11	4.8	0	0	4.8	4.8
2	183	6.4	0.09	0.02	6.4	6.5
3	60	8.3	0	0	8.3	8.3
4	253	7.9	0.19	0.03	7.8	8.0
5	442	8.0	0.16	0.02	8.0	8.1

Bluegill

Age	Number	Mean TL	Var	SE	Lo 95%CI	Up 95%CI
1	64	3.1	0.28	0.07	3.0	3.2
2	113	5.2	0.25	0.05	5.1	5.3
3	44	6.4	0.28	0.08	6.3	6.6
4	65	7.0	0.83	0.11	6.8	7.3
5	42	7.9	0.08	0.04	7.8	8.0
6	4	8.3	0	0	8.3	8.3

Largemouth bass

Age	Number	Mean TL	Var	SE	Lo 95%CI	Up 95%CI
1	28	5.1	0.94	0.18	4.7	5.5
2	19	8.6	1.21	0.25	8.1	9.1
3	32	11.6	1.54	0.22	11.1	12.0
4	42	12.4	0.88	0.14	12.1	12.6
5	14	14.8	1.63	0.35	14.1	15.5
6	10	16.7	0.56	0.24	16.3	17.2
7	2	17.3	0	0	17.2	17.3

Species White crappie	YEAR CLASS	NUMBER OF FISH AGED	SIZE RANGE	BACK CALCULATED LENGTH (inches) AT EACH AGE							
				I	II	III	IV	V	VI	VII	VIII
Intercept = 1.4	2005	3	4.6 - 4.9	4.2							
	2004	12	5.3 - 6.9	2.9	5.9						
	2003	1	8.4	2.8	6.3	8.2					
	2002	8	7.0 - 8.8	2.5	5.2	6.6	7.4				
	2001	11	7.1 - 8.9	2.3	5.1	6.4	7.1	7.9			

Species Bluegill	YEAR CLASS	NUMBER OF FISH AGED	SIZE RANGE	BACK CALCULATED LENGTH (inches) AT EACH AGE							
				I	II	III	IV	V	VI	VII	VIII
Intercept = 0.8	2005	18	2.1 - 4.1	2.7							
	2004	17	4.2 - 6.4	1.8	4.7						
	2003	10	5.7 - 7.1	1.6	3.3	6.1					
	2002	8	4.8 - 7.6	1.7	3.2	4.9	6.4				
	2001	6	7.7 - 8.6	1.7	3.7	5.7	6.9	8.0			
	2000	1	8.1	1.6	2.5	4.0	5.7	7.4	8.0		

Species Largemouth bass	YEAR CLASS	NUMBER OF FISH AGED	SIZE RANGE	BACK CALCULATED LENGTH (inches) AT EACH AGE							
				I	II	III	IV	V	VI	VII	VIII
Intercept = 0.8	2005	14	3.8 - 6.7	5.0							
	2004	11	6.6 - 10.0	3.8	8.1						
	2003	15	9.0 - 12.9	4.5	7.9	10.3					
	2002	14	10.7-13.9	4.7	8.3	10.4	11.8				
	2001	8	13.5-17.0	5.2	9.0	11.0	12.9	14.1			
	2000	5	15.0-17.5	4.3	8.8	11.6	13.8	15.3	16.2		
	1999	1	17.3	4.3	7.6	10.3	12.8	15.6	16.5	17.1	

GPS LOCATION OF SAMPLING EQUIPMENT								
GILL NETS			TRAP NETS			ELECTROFISHING		
1	N 39 51.385	W 84 52.479	1	N 39 51.235	W 84 52.406	1	N 39 51.523	W 84 52.426
	N	W	2	N 39 51.497	W 84 52.048		N	W
2	N 39 51.347	W 84 52.271	3	N 39 51.977	W 84 51.709	2	N 39 51.408	W 84 52.210
	N	W	4	N 39 51.003	W 84 51.794		N	W
3	N 39 51.601	W 84 52.084	5	N	W	3	N 39 51.819	W 84 51.933
	N	W	6	N	W		N	W
4	N 39 51.672	W 84 52.006	7	N	W	4	N 39 51.746	W 84 52.292
	N	W	8	N	W		N	W
5	N 39 51.856	W 84 51.914	9	N	W	5	N	W
	N	W	10	N	W		N	W
6	N 39 51.959	W 84 51.913	11	N	W	6	N	W
	N	W	12	N	W		N	W
7	N 39 51.892	W 84 52.132	13	N	W	7	N	W
	N	W	14	N	W		N	W
8	N 39 51.717	W 84 52.318	15	N	W	8	N	W
	N	W	16	N	W		N	W
9	N	W	17	N	W	9	N	W
	N	W	18	N	W		N	W
10	N	W	19	N	W	10	N	W
	N	W	20	N	W		N	W
11	N	W				11	N	W
	N	W					N	W
12	N	W				12	N	W
	N	W					N	W
13	N	W				13	N	W
	N	W					N	W
14	N	W				14	N	W
	N	W					N	W
15	N	W				15	N	W
	N	W					N	W
16	N	W				16	N	W
	N	W					N	W
17	N	W				17	N	W
	N	W					N	W
18	N	W				18	N	W
	N	W					N	W
19	N	W				19	N	W
	N	W					N	W
20	N	W				20	N	W
	N	W					N	W